

## PreCalculus Standards

### Chapter 1 Standards

1a	Draw angles that are negative or are larger than $180^\circ$ .
1b	Find the quadrant and reference angles of a given angle in standard position.
1c	Given a point or trig function value and quadrant of the terminal side of an angle, find the exact value of all the trigonometric functions of the angle.
1d	Convert between radians and degrees.
1e	Apply 30-60-90 and 45-45-90 triangle dimensions to the unit circle
1f	Use exact values from the special triangles to simplify trigonometric expressions
1g	Use a calculator to find approximate trigonometric values for a given angle and approximate angle values for a given trigonometric value.
1h	Find and draw a resultant vector from other component vectors.
1i	Find the direction angle of a resultant vector from other component vectors.
1j	Model and solve problems involving vectors

### Chapter 2 Standards

2a	Use a graphing calculator to find the graph of a trigonometric equation.
2b	Find the graph from the equation of a sinusoidal without a graphing calculator.
2c	Given a sinusoidal graph or its traits, find its equation.
2d	Given a sinusoidal equation, find values of $y$ from $x$ and vice versa.
2e	Model and solve sinusoidal situations.
2f	Find the graph from the equation of tangent, cotangent, secant, and cosecant functions.

### Chapter 3 Standards

3a	Prove basic Trigonometric Identities and use them to simplify Trigonometric equations
3b	Factor polynomials using grouping and sum/difference rules
3c	Prove trigonometric identities that involve factoring.
3d	Find exact trigonometric values for composite arguments.
3e	Solve equations involving composite argument rules.
3f	Prove identities involving composite rules.
3g	Find exact trigonometric values for double angle trigonometric functions.
3h	Solve equations involving double angle rules.
3i	Find exact trigonometric values for half angle trigonometric functions.
3j	Solve equations involving half angle rules.
3k	Solve mixed trigonometric identity problems using algebraic substitution and factoring

### Chapter 4 Standards

4a	Find equations and intercepts of lines from points, slopes, and parallel or perpendicular lines.
4b	Find equations, zeros, vertex, and range of a parabola.
4c	Apply quadratic functions to projectile motion problems
4d	Find complete graphs, zeros, and extreme points on the calculator.
4e	Apply polynomial functions to solve real-world application problems involving optimization.
4f	Factor polynomials to find zeros algebraically using synthetic substitution.

4g	Find the equation of a polynomial from its zeros.
4h	Use factoring to determine the sign patterns of a polynomial

### Chapter 5 Standards

5a	Evaluate limits involving the indeterminate form $0/0$
5b	Find the derivative (slope of the tangent line) of a polynomial function at a given point
5c	Use the limit definition to find the derivative of a polynomial function
5d	Find the derivative of a polynomial function using the Power Rule
5e	Find the equation of the tangent and normal lines to a polynomial function at a given point
5f	Use the equation of the tangent line to approximate function values
5g	Given the position function of an object as a polynomial, use the derivative to find the velocity and acceleration functions
5h	Use sign patterns to describe the motion of an object
5i	Given the position of an object in parametric motion, find the speed of the object, and find the velocity and acceleration functions.
5j	Interpret the sign pattern of the velocity functions of an object in parametric motion.

### Chapter 6 Standards

6a	Use the derivative to find the extreme points of a polynomial
6b	Use sign patterns to determine the intervals where a function is increasing or decreasing
6c	Use the derivative to find the range of a polynomial
6d	Identify the type of extreme point represented by a particular critical value
6e	Use the derivative to solve optimization problems
6f	Sketch a polynomial graph using the traits of Domain, $x$ and $y$ intercepts, End Behavior, Extreme Points, and Range

### Chapter 7 Standards

7a	Find Zeros, Vertical Asymptotes, and Points of Exclusion of a Rational Function and distinguish them from one another
7b	Determine the end behavior of a rational function from a model, polynomial long division, or infinite limits and sketch the horizontal or slant asymptote.
7c	Find the derivative of a rational function using the Quotient Rule
7d	Apply sign patterns to the first derivative.
7e	Find the extreme points of a rational function
7f	Use sign patterns to solve rational inequalities.
7g	Find all the traits and sketch a fairly accurate rational curve algebraically.

### Chapter 8 Standards

8a	Use sign patterns to determine the domain of a radical function
8b	Find the derivative of a composite function using the Chain Rule
8c	Find the critical values and extreme points of radical functions
8d	Find all the traits and sketch a radical curve algebraically
8e	Take derivatives of relations implicitly.
8f	Use implicit differentiation to find higher order derivatives
8g	Use implicit differentiation to solve related rates problems

### Chapter 10 Standards

10a	Solve equations involving exponential and/or logarithmic functions
10b	Solve real-world financial problems involving exponential and logarithmic operations
10c	Use sign patterns to determine the domain of exponential and logarithmic functions.
10d	Find zeros and Vertical Asymptotes of exponential and logarithmic functions.
10e	Find derivatives and extremes of log and exponential functions
10f	Finding and using tangent lines for log and exponential functions
10g	Find the derivative of a product of two functions
10h	Apply L'Hopital's Rule to solve indeterminate limits